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ABSTRACT

Two case studies of students learning to write academic discourse, particularly to maintain cohesion and relevance, are described. The two college students were part of a fourth-year biology class: one was a native English speaker, and the other spoke English as a second language. Both had a good command of spoken English grammar at the sentence level. The case studies address the following issues: violations of relevance rules for the grammar of written academic discourse, the students' means of acquiring these rules, and the relation of acquisition to error. Numerous samples of compositions produced by these students for the biology course are analyzed. It was found that the students most often had problems with relational predications in their essays. Models that are close to the skill level of the student, insight, and practice are all essential to the acquisition of the rules of discourse. Finally, acquisition of these rules was found to be accompanied by vocabulary errors, mixed constructions, and tense inconsistency. (RW)

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On Learning to Write Academic Essays: Case Studies:

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On Learning to Write Academic Essays: Case Studies

ESL students who enroll in a beginning composition course usually have one thing on their minds: grammar. In the advanced composition course and in other courses on campus they come to be concerned about their content, their coherence, and whether they sound sufficiently sophisticated. This paper will focus on the experience of one ESL student, Tomas--from Guam, and one native speaker of English, Rudy--from the island of Maui, both of whom knew that their grammar was nearly perfect and who were dismayed to find their papers returned marked unacceptable, largely irrelevant, not on the point. For both students, the problem was one of acquiring the language appropriate to written academic discourse, especially learning a grammar that goes beyond the level of the sentence and straddles the barrier normally supposed to exist between language and thought. Part of this grammar is the maintenance of cohesion as Halliday/Hasan have described it, but part of this grammar is the maintenance of relevance--something which a theory of cohesion does not claim to explain.

Several aspects of the two students' experience are spelled out in my book Composing and Coherence; today I would like to address particularly the questions of language acquisition that

their experience calls to mind. I will list these both specifically, as related to their experience, and generally as related to the general student experience.

On Learning to Write Academic Essays: Case Studies

Specific Questions	General Questions
1.What were the relevance rules of discourse grammar violated by the two students?	1. What are the relevance requirements of written academic discourse?
2. How did the students acquire these rules?	2. What is involved in the learning act? insight? models? practice?
3. As acquisition progressed, what developmental strains occurred?	3. How is acquisition related to error?

The two students were part of a class of eleven fourth-year biology students, nearly half of them ESL high achievers from islands of the South Pacific, who were enrolled in a special one-year review program at the medical school here at the University of Hawaii. With good grades in the review program they would be admitted to the medical school proper. As part of their special program they were being asked to improve their writing skills, an effort in which I played writing instructor. In cooperation with their biology instructor, I gave them a writing exercise once a week for a semester, though in the interests of saving time, I did not hold class meetings. I simply had them write in class about two handwritten pages, giving them first a lead-in sentence, which was a classic topic sentence, composed by the biology professor, asking them to use this as their own first sentence, and then to follow up in a natural way. I graded these essays on the quantity of detail, the coherence, and the grammar. I then put them back in each student mailbox with a copy of a model essay written by one member of the class.

Let us begin with question 1: what were the relevance rules of discourse grammar violated by the two students? Here I am taking faults in relevance to be a cause of incoherence--because prose that was irrelevant or off the point created bumps and jolts at the places where the student composer left the point and returned to the point. In order to create a coherent essay students had to follow up the given lead-in sentence with

relevant information. Thus we come to the question, "What made information in these essays relevant? What were the relevance conditions?" Let us look at an example essay. When the lead-in was

Muscle cells are cells specialized for contraction.

the follow-up sentences had to do more than repeat the noun, muscle cells--i.e., they had to show more than features of cohesion. They had also to relate to the words "specialized for contraction." The student writers had to show that the cell's structure--its four kinds of proteins, the arrangement of these proteins, and the other attributes of these proteins--enabled the cell to contract.

Yet, when my two students, Rudy and Tomas, wrote their essays, they did not speak of proteins and contraction. The information they chose for their follow-up sentences seemed quite unrelated to contraction: Let us look at Rudy's essay--

I will choose examples from Rudy's papers today to illustrate the patterns of composition in both students' papers

Rudy, Essay 1

Muscle cells are cells specialized for contraction. Muscle cells can also be called muscle fibers. These fibers run longitudinally and parallel among each other. These muscle fibers constitute muscle bundles. The latter also run longitudinally and parallel among each other to form the muscles of the body.

There are three different types of muscles in the human body. These three types are cardiac, smooth, and skeletal muscles. These muscles are different among each other due to location and physical appearances.

Smooth muscle can be found in the lining of the digestive system, respiratory system, and also in the excretory system. Smooth muscle fibers are under involuntary control of the autonomic nervous system. Smooth muscle fibers have longitudinal striations, but no cross striations. The width of smooth muscle fibers are very narrow, much narrower than the other two types of muscle. It has also a centrally located nucleus.

Cardiac muscle can be found in the lining of the heart. Cardiac muscle is also under involuntary control of the autonomic nervous system. These muscle fibers have longitudinal striations and cross striations. They also have a centrally located nucleus, sometimes there can be two nuclei instead of one. The width of the muscle is a little wider than of smooth muscle.

Skeletal muscle makes up the bulk of the body muscle framework. These muscle fibers are connected to tendons which in turn is connected to the skeletal system. These muscle fibers are under voluntary control (etc.)

While we would agree that an essay such as this one runs off the point, we would probably not agree that something is wrong with the sentences. But I will argue that something is wrong with the sentences; they violate the discourse rules for most university writing. What is wrong with Rudy's sentences becomes apparent to us when we compare his essay with a portion of an essay written by Richard, the top student in the class and perhaps not coincidentally the best writer in the class.

Notice that Richard's passage sounds coherent and his sentences sound relevant to the lead-in. We make such judgments intuitively. It was on the basis of such intuition that I at first sorted the essays into successful and unsuccessful--these being the relevant and the irrelevant. In addition, I considered one other feature--the quantity of detail. Those essays with insufficient detail, no matter how coherent they sounded, I threw aside. Faced with two piles of essays, both having detail in quantity but only having relevance, I sought the linguistic features that differentiated these two piles.

The analysis of Richard's passage shows what I found to be the salient feature of relevance--this being the presence of relational predications. Here I borrow the notion of Grimes' rhetorical predicates, though unlike Grimes, I am not ready to specify these and will say only what I think they were in the biology essays I investigated. Richard's sentences (unlike Rudy's) have more than a single component predication. His

words "all" (S 3), "if" (S 4), and so forth introduce additional predications. So, instead of making one statement here, he is making three. Two of these three are content predications; one is a relational predication.

Richard

1) Several body systems are involved in maintaining salt and water balance. 2) They include the digestive system, the urinary system, and the skin's secretary system. 3) All of these systems involve the secretion of sodium ions since sodium is the major determining ion that causes water to flow across cell membranes. 4) If sodium salts are secreted, water follows. 5) That is the law of osmotic transport.

1.	lead-in	Several body systems are involved in maintain...
2.	a.Relational	Sentence 2b SPECIFY Sentence 1
	b.Strand 1	They are the digestive system, the urinary...
	c.Strand 1	The skin has a secretory system
3.	a.Relational	Sentence 3b GENERALIZE Sentence 2
	b.Strand 2	They involve secretion of sodium ions
	c.Relational	Sentence 3d CAUSE Sentence 3b
	d.Relational	Sodium CAUSE Sentence 3e
	e.Strand 2	Water flows across cell membranes
4.	a.Relational	Sentence 4b CAUSE Sentence 4c
	b.Strand 2	Sodium salts are secreted
	c.Strand 2	Water follows
5.	a.Relational	Sentence 5b GENERALIZE Sentence 4
	b.Strand 1	This is the law of osmotic transport

Number of sentences with relational information: 4 out of 4, 100%.

Number of relational predications: 6 in 4 sentences, or 1.50 per sentence.

Average number of predications per sentence: 3.70.

I have spelled out in an article for the TESOL Quarterly the details of the relational predication; what I argue is that X is an apple and X is an example have similar syntax, but that X is an example has a connective function within the paragraph that X is an apple does not have. X is an example of Y is a meta statement when the X and Y slots are filled in with lower-level statements. In my own analysis I have called X is an example a "rhetorical predication" no matter what the X and Y slots are filled in with. Example was one of four rhetorical predications that I found to be significant in these students' essays; the other three were cause, comparison, and generalization. Time and space relations were not significant in the biology essays.

Admittedly, the relational predication is sometimes not a fully realized subject-verb predication. Sometimes, as in Richard's passage, the predication is reduced to a single word; sometimes the example predication is conveyed with no word at all, sometimes by the adverbial phrase "for example," but other times--as we shall see later--the predication is spelled out in the surface sentence: "something is an example of something," and this full syntactic form argues for an analysis that grants it full subject-verb value. That is, I argue the following: writers, when they use logical connectives like however, but or nevertheless, are doing more than inserting connective glue. All of these words indicate contrast predications, statements

made by the writers that X is in contrast to Y. Academic writers like my pre-medical students thus convey statements which, in the process of composing, they bring together with statements of different types. Not only do they do so--they must do so. There is an obligation on them to carry a combination of relational and content predications. What was wrong with Rudy's essay, the first one about muscles which went off the point, was that he did not include enough relational predications: he needed at least one in every sentence and over a passage as a whole an average of 1.25 per sentence. And though he produced some, he failed to produce enough. This is how Rudy violated the discourse grammar.

Yet when his number of relational predications was low, too low to meet the relevance requirement, his information was related together in another fashion. I would like to examine this other mode because I think it shows us the logic of the student when to us, there appears to be no logic.

What Rudy and Tomas did was to begin with the top of their information. They started from what they knew and simply went forward, placing each piece on the paper. Look, for example, at Rudy's Essay for which the lead-in sentence was:

The digestive system has immune system components.

Think first about what they should have written next. The intended topic was the immune system components that are located in the digestive tract, these being, in some cases,

Rudy, March 2

1) The digestive system has immune system components. 2) These immune system components are found in the walls of the alimentary canal. 3) The walls of the digestive system consist of four distinct layers. 4) The four layers are mucosa, submucosa, muscularis externa, and adventitia or serosa. 5) Primarily, the immune system components are found only in the mucosa, and submucosa layers.

6) The mucosa layer of the digestive tract is comprised of three layers. 7) The mucosa layer is the innermost layer of the four distinct layers. 8) It is the layer that is closest to the lumen of the digestive tract. 9) The three layers which constitute the mucosa layer are, epithelia cell layer (innermost), lamina propria (middle), and muscularis mucosae (outermost, adjacent to the submucosa).

structures like lymph nodes, in others structural features like tight-fitting "junctions" between cells to keep out invading bacteria, and, in still other cases, processes like mucus secretion or phagocytosis, a kind of swallowing-up of the invading bacteria. To arrange this information was a complex task. Most students did it by naming the immune components, categorizing them in one way or another--as specific and non-specific responses, or as physical and chemical barriers. Some classified the immune components by their location along the digestive tract--higher, middle, and lower. But in every case the successful students took their task to be a specifying task: one should specify the components, showing in what way each one fought off bacteria.

What Rudy did was to get sidetracked from the specifying nature of his task by the spatial arrangement of his information. He had apparently learned his information in a spatial arrangement and could not change the structure of what he had learned. He began his essay by naming the four layers of the wall of the alimentary canal, or the digestive tract.

Needless to say, Rudy's thinking was in a locational channel. As if he were in a car traveling around the body, he gives us the names of body parts as he encounters them--not before. It is natural, therefore, that he will give the reader information that to the reader is distracting, needless, and annoying. One is reminded of evenings spent watching a friend's slides of a recent tour. Expecting to learn something about a foreign culture, foreign food, dress, or the nature of the landscape, we learn instead that the traveler flew from A to B, took the train to C, went to D for 3 days, stayed in a terrible hotel at E, and then on to F, G, H, and I--a case of hearing more than we want of one kind of information and not enough of another. In the case of home slides, one can hardly blame the shower of the slides, who probably made no promises to the viewer in advance. In the case of Rudy, the student writer, however, there was an advance commitment: the lead-in sentence committed him to a heavily relational mode of written discourse. This lead-in was a signal to the reader, saying, in effect, "here is a general statement; now the writer is going to specify, to compare, to give you reasons and examples." To be relevant in this writing situation meant giving the reader as much of this kind of information as the reader, schooled in the modes of academic discourse, expected.

In a taped interview with Rudy he said at first that his problems with relevance in writing were caused by the length requirement for the writing exercise. To be direct, or "to go right to the point of the lead-in sentence" would cut down on the amount of material he thought he could use. In the interview there was quite a discussion about "direct writing," and here I quote from my forthcoming book:

A spatial arrangement was not the only way Rudy mentally fixed information. Sometimes, as a later essay shows, it was time fixed; thus he felt it necessary to start at what he considered the "right moment" in time. Thus when the lead-in was:

> A hormone may have more than one target cell and thus regulate more than one activity.

Rudy thought quite correctly of the chronological sequence of hormones traveling to target cells and then causing those cells to act in certain ways. But for him the right moment in this sequence was not the moment of hormone secretion. For him the narrative properly began with the existence of glands. Why? Because it is glands that secrete hormones. Even though glands were not relevant to the writing task, their existence was seen as prior to that of hormones. Therefore, all Rudy's examples of hormones begin with the naming of glands. In spite of the given lead-in, they had to come first.

Yet Rudy and Tomas improved; the number of relational predications went right up in their later essays. They apparently acquired the abstract rule that relational predications were obligatory. The question now, Question 2, is how they learned: what sort of practice did they have, what sort of instruction did they receive, what sort of insight might they have had on their own?

I infer that somewhere during the semester there was a discovery made by the two students that led to a conscious change in their approach. In the case of Tomas, I am quite sure that there was a consciousness, a point at which he said, "Oh, I see now. I always thought you should start with background. Now I see that you don't want background--because if you start with the main argument in the first sentence, then you have to just stick with that and you can't go backwards and then lead up to it." I do not have his exact words recorded, but this was the gist of his discovery and "background" was his word. Tomas at this point may well have had a conscious understanding that the essay form in this exercise demanded explicitness from the very first sentence, a kind of bluntness that in his own verbal tradition might have been unattractive. In effect, I think he was shrugging his shoulders and saying, "OK, if that's the way people in college write, I will write that way." With Rudy I was less sure that the acquisition I saw evidence of was based on consciousness and insight--and I was also less confident than with Tomas that the changes I noticed would be permanent ones.

There were two factors of instruction that I infer were necessary to the student's insight, assuming that Rudy had at least some. One factor was my feedback with respect to relevance, and the other was the model essay which I handed every student each week--a copy of the best one written in the class, or a composite version of the best ones. Feedback with respect to relevance was of the simple yes/no type--conveyed by written comment. Yes, this is all relevant, yes this is relevant except where underlined, or no, most of this is irrelevant, as I have shown above. I did not tell the student how to rephrase--and this is a practice I suggest in regard to relevance--not to rephrase as one corrects student papers but to rephrase only as a class activity, where one can solicit from the class suggestions for rephrasing. Identify the problem, I suggest. Tell the writer how you have reacted, but leave it to him or her to find a solution. Students frequently misunderstand the thrust of our suggested re-writings, especially so with respect to relevance where no single re-phrasing is in itself the correct form, and students are likely to think that the suggested phrasing is the correct form. Much better to let them stew for a while, muddling through the significance of the teacher's comment: not relevant? what do you mean, not relevant? -- and then to arrive at their own rephrasing or rewritten version. The operating principle here is that a writer cannot argue with a reader's experience--that the instructor found this irrelevant

is a statement about what happened in the mind of the reader. Writers cannot say that it didn't happen.

Just how Rudy and Tomas discovered what constituted relevance for the biology writing context and what distinguished relevant information from background information, I am not sure. I did not tell them about my own general conclusion that the quantity of relational predications makes the difference. I conclude that their reading of the sample essay coupled with my "no" remarks about relevance activated a knowledge that they already had. I am with Plato here in assuming that what a teacher does is to awaken knowledge already in the student, in this case a knowledge that in arguing a point, one must proceed by specifying and showing reasons. Why, then, do students not act on this knowledge when they ought to? I believe the cause is distraction: there is an enormous temptation to follow the course of what one knows, to get caught in a trap of ready-made information rather than to create a brand-new fabric of information shaped for purposes of logical argument. The function of the instructor, therefore, is a reminding and a pointing function: reminding writers that relevance is important and pointing to the text with the question: "Is this relevant to this?" If students disagree with our judgments here, as Rudy did with mine, I think the cause is not so much stubbornness as interference. A strong verbal habit of beginning at the top of what they know interferes with the thesis-first tradition of academic prose.

For this reason, the scientific lab report style is a blessing for ESL students. While the lab report style does not allow them to start with the top of their information, it at least makes very clear what information is expected. Also it does not require students to mix relational with content predications early in the report. Only in the discussion section is there such a heavy demand for this kind of mix. One thing we can do to make some writing tasks more manageable than others is to devise set forms of this kind that do not impose the demand for relational predications.

Now to Question 3:

As acquisition progressed, what developmental strains occurred? Allow me to illustrate, showing you sentences that accommodate both relational predications and other lower predications--sentences, in other words, that meet the relational demand of the writing task.

When the relational predication had to be combined in a single sentence with other predications, it was often the relational which came to occupy the position of main verb. In the following, for example, the main verb was reserved for a COMPARATIVE relationship:

> The retention of excess salt and water in the extracellular spaces <u>is like</u> drowning the cells.

Another student writer used the main verb for CAUSE. The result is less graceful than the first, perhaps because of the number of relationships crowding the sentence.

This is because they are long cells, and
because of this, to keep the cytoplasm to nucleus
ratio small, many nuclei are needed per cell.

A third sentence shows information stumbling over itself. This time again the main subject and verb are relational: "Some examples would be..."

Some examples of physical barriers would be
that all the epithelium of the mucus layer
of the digestive system has tight junctions,
which allows nothing to enter intercellularly,
only through the epithelial cell, and the outermost
cells are cornified.

In each sentence above the idea of relationship occupies the focal position--the main verb position--as though the student were really thinking of these relationships as assertions:

this is like
this is because
some examples would be

Especially revealing is the last sentence, which may have caused trouble for the reader. The writer's commitment to communicate a sense of relationship is apparently primary; thus the predication:

Some examples of physical barriers would be...

But the commitment to fill in the blank to the right of "would be" is also pressing. And what the student possesses in the way of

relevant information for filling this blank is apparently stored in the memory in full subject-verb form. The resulting sentence shows a clumsy splicing of the two required predications, first the relational one and then the content one:

relational
Some examples of physical barriers would be

content
that all the epithelium of the mucus layer of the digestive system has tight junctions,...

A more skilled writer would have blended the two predications, reducing one of them syntactically, perhaps like this:

relational
Some examples of physical barriers would be

content
the tight junctions between the cells of the digestive system's epithelial layer...

Or the example predication could have been reduced from clause form to the short adverbial form, for example, or even left out entirely in some contexts with no sacrifice of meaning.

Look, now, at another sentence that is interesting in the same way. This one again shows the writer at work (a different student from the same class), attempting the same sort of integration between relational and content predications. Again there is a misfit between the syntax of the two types of information, but this time the writer tries--in the process of writing the sentence--to find the correct fit. Apparently his trouble begins when he cannot find the relational syntax he wants, the

phrase the more something there is, the more something there will be, a phrase listed, incidentally, by Mina Shaughnessy as one of the vocabulary of structures with which her students had trouble. It is this phrase which will express the comparative and causal notion that this student has in mind: he wants to say that the more alveolar ducts there are in the lungs, the greater the number of alveoli, or little air sacs, there will be; the greater the number of air sacs the greater the amount of surface area and hence the greater the opportunity for gases to exchange across the membranes of these sacs. Complicated it is indeed to recall the anatomy of the lungs. More complex still is the problem of integrating this information with the relational predication. Having written part of the relational predication below, the writer halts, crosses out the word there, then proceeds. Coming to the phrase exchange of gas, he crosses out again, then proceeds again.

> Therefore, the more alveolar ducts ~~there~~
> in the lungs will have more alveolus and hence,
> a greater ~~exchange-of-gas---carbon-dioxide-and-oxygen~~
> surface area for gas exchange to take place efficiently.

The first cross-out occurs at the point where relational is joined with content information--apparently he simply gave up on the syntax of the relating phrase the more X, the more Y--and the second cross-out occurs when the notion of EFFECT--the opposite of CAUSE--enters in. The word exchange represents the

wrong effect at this point; he apparently realizes while writing that surface area is an intervening effect, a link he had left out in a chain of causes. In sum, what has given this writer trouble in composing the sentence is relational thinking. This thinking appears to be on two levels. On one level he must conceive of the correct relationship, while on another level he must find the relational phrasing that fits gracefully, something he was unable to do.

For the less skilled writers these troubles arose under certain circumstances. They arose when the students shifted away from modes of coherence based on repetition and parallelism and toward modes of coherence based on a density of relationships. They arose when these students tried to make their statements of relationship explicit rather than implicit. And they arose when they tried to combine an explicit point about a relationship with an explicit point about the way the human body worked. In sum, the less skilled writers got into syntactic messes precisely at the points where they were doing what the assignment asked them to do.

Now with regard to the general side of the questions:

Question 1 -

I am suggesting that relational predications are obligatory in student papers and in-class essays, made so by the fact that a thesis statement is normally expected early in the piece of

writing. And while it is surely true that metastatements control every piece of writing, not just academic prose, they crop up in explicit form more frequently in academic prose. It may be that they crop up less in the writing of very good academic writers--and that they create problems of language for inexperienced writers, especially when such predications are a key to conceptual thinking.

Question 2 -

Insight is crucial, when it comes to learning the rules of relevance--a point of discovery for each student, a time when the student says in words of his/her own: "Oh, I see....what you're supposed to do is...and what I've been doing is...." Models, I believe, are extremely helpful to students though I believe that they should not be far removed from the skill level of the student. The professional reading that they do serves, of course, as models, but sometimes elevated style and language does nothing but scare students at the beginning and intermediate levels. Practice, of course, is the essence of the craft.

Question 3 -

When students acquire rules of relevance, the process of acquisition is coupled with error in vocabulary, with mixed constructions, and with tense inconsistency. Thus, as with other studies in language, this one with medical students and biology writing suggests that acquisition invites error.